Detailed Action

Receipt is acknowledged of the amendment, filed on 26 December 2007, which has been entered in the file. Claims 4, 6, and 40-45 are cancelled; claims 1-3, 5, 7-39, and 46-49 are pending.

It should be noted, that the applicant has listed under "prior applications" of the declaration, application no. 09/354,891, filed 16 July 1999; if the applicant wishes the application publication to appear under the 'References Cited,' then an IDS naming the application should be filed.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 25-27, 29-30, 33, and 46 rejected under 35 U.S.C. 102(e) as being anticipated by McGrew (Publication No.: US 2002/0021003 A1).

Re claim 25, McGrew teaches a method for authenticating a product or document (p. 1, para. 0024), the method comprising: labeling the product or document with one or more luminescent of fluorescent tags (p. 2, para. 0033-0035, p. 3, para. 0045, 0056); measuring the decay time or luminescence intensity of one or more

signals emitted from one or more luminescent tags using an optical scanning component, after the tags are illuminated with one or more appropriate energy sources (p. 2, para. 0035, 0039, p. 4, para. 0062, 0067); analyzing the signals using an information technology component (p. 2, para. 0035, 0037-0039); and identifying from the decay time a specific tag for authentic the product or document (p. 2, para. 0038-0042, p. 3, para. 0042-0043).

Re claim 30, McGrew teaches a method for product or document authentication (p. 1, para. 0024), the method being used to detect the presence of two or more dyes used as tags for the product or document (p. 2, para. 0035, 0038-0040, p. 3, para. 0045), the combination of the dyes yielding a unique identifier (signature, p. 2, para. 0038), wherein the method comprises: treating the tagged samples by exposing them to elevated temperature, electromagnetic radiation or washing with solvents (p. 4, para. 0067); detecting the decay time of luminescence intensity of the two or more dyes (p. 2, para. 0037-0038, p. 4, para. 0062); and comparing the decay time detected verses control samples treated by similar exposures to elevated temperature, electromagnetic radiation or washing with selected solvents (p. 2-3, para. 0041-0043).

Re claim 29, McGrew teaches a method for product or document authentication (p. 1, para. 0024), the method comprising: labeling the product or document with one or more luminescent or fluorescent tags (p. 2, para. 0033-0035, p. 3, para. 0045, 0056); measuring the decay time of luminescence intensity of one or more signals emitted from one or more luminescent tags using an optical scanning component, after the tags are illuminated with one or more appropriate energy sources (p. 2, para. 0035, 0039, p. 4,

para. 0062, 0067); analyzing the signals using an information technology component (p. 2, para. 0035, 0037-0039); and identifying from the decay time a specific tag for authentic the product or document (p. 2, para. 0038-0042, p. 3, para. 0042-0043).

Re claim 26-27, McGrew teaches at least one of the tags has an emitted signal of known time resolution, or the time for the tag to decay to a predetermined value is known (p. 2-3, para. 0037-0043).

Re claim 33, McGrew teach the luminescence of dye tags is recorded using a spectrophotometer (Fig. 6, spectral signature is measured by the reader, p. 2, para. 0038-0040).

Re claim 46, McGrew teach the product or document is additionally treated with heat or light (light is pulsed, p. 4, para. 0067).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over McGrew (Publication No.: US 2002/0021003 A1), as applied to claim 30 above, and further in view of Wickersheim (US Patent No.: 4,652,143). The teachings of McGrew are disclosed above.

Re claim 36, McGrew fails to disclose that the tag be heated before analysis at 50-250 degrees Celsius.

Wickersheim teach the use of luminescent material deposited on a substrate, which is attachable to a subject (luminescent tag, col. 4, line 47, col. 5, line 10, and col. 13, line 5). The effect of heat on the luminescence of the tag is known, and is used to determine the surface temperature of a subject to which the tag is attached (col. 5, lines 31-36, col. 7, line 59- col. 8, line 11) by reference to a corresponding luminance-temperature values in a table (col. 10, lines 31-47).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify McGrew with the teachings of Wickersheim in order to provide an additional variable as a security feature, and way to verify that the tag is not counterfeit. A method in which a sample is heated to a known temperature, a spectra taken by a detector, and a comparison made of the luminance of a sample to a table of temperature-luminance values, is simply using the luminance-temperature table of Wickersheim in the reverse order, and therefore would have been obvious. As for a spectral analysis taken between a temperature of 50 to 250 degrees Celsius, a temperature range is truly arbitrary so long as the corresponding luminance value is known, and therefore also obvious to a person of ordinary skill. Furthermore, heat sensitive inks have long been used to check the authenticity of a subject.

3. Claims 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over McGrew (Publication No.: US 2002/0021003 A1) as applied to claim 30 above, and

further in view of Molina (US Patent No.: 3,777,157). The teachings of McGrew are disclosed above.

Re claims 38-39, McGrew fails to disclose washing the tagged samples with a solvent, or an identity of solvent, before spectral analysis of the tag.

Molina teach the fluorescent material deposited on a subject be washed with water (col. 2, lines 20-66).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify McGrew with Molina for the advantage of detecting cracks and flaws on a surface (Molina, col. 4, lines 8-26), such testing would lend it's self well to validating the authenticity of a product.

4. Claims 1-3, 5, 9-10, 12-17, 20-21, 23-24, and 47-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over McGrew (Publication No.: US 2002/0021003 A1) in view of Ahlers (Publication No.: US 2002/0131618 A1).

Re claim 1, McGrew teaches a system for product or document authentication (p. 1, para. 0024), the system comprising: one or more luminescent or fluorescent tags (p. 2, para. 0035), the tags being applied to the product or document (p. 2, para. 0033-0034), wherein at least one of the tags is a mixture of more than one compound and wherein at least one of the tags is a mixture consisting of at least a luminescent compound (p. 2, para. 0039); an optical scanning component for detecting a signal emitted by the tag (Fig. 4, p. 2, para. 0035, 0039); and an information technology component for analyzing the signal (p. 2, para. 0035, 0037-0039).

McGrew fails to teach the mixture also consists of a luminescence lifetime modifier.

Ahlers teaches a luminescence lifetime modifier (p. 2, para. 0025).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify McGrew with Ahlers in order to provide a way of varying the security feature of the luminescence decay time. Thus specific temporal signatures can be designed for the authentication tags (Ahlers, p. 2, para. 0025).

Re claim 21, McGrew teaches a system for product or document authentication (p. 1, para. 0024), the system used to detect the presence of one or more luminescent or fluorescent dyes (p. 2, para. 0035), wherein the dyes are applied to the product or document (p. 2, para. 0033-0034), wherein at least one of the tags is a mixture of more than one compound and wherein at least one of the tags is a mixture consisting of at least a luminescent compound (p. 2, para. 0039), and wherein the system comprises: an optical scanning component for detecting a signal emitted by the dyes (Fig. 4, p. 2, para. 0035, 0039), and an information technology component for analyzing the signal (p. 2, para. 0035, 0037-0039).

McGrew fails to teach the mixture also consists of a luminescence lifetime modifier.

Ahlers teaches a luminescence lifetime modifier (p. 2, para. 0025).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify McGrew with Ahlers in order to provide a way of

varying the security feature of the luminescence decay time. Thus specific temporal signatures can be designed for the authentication tags (Ahlers, p. 2, para. 0025).

Re claim 2, McGrew teaches at least one of the luminescent tags has an emitted signal of known time resolution (tag is identified by the fluorescence signature which consists of a combinations of spectral and temporal properties, p. 2, para. 0037-0038, 0040-0041, p. 3, para. 0042).

Re claim 3, McGrew teaches the known time resolution is the time for decay of luminescence intensity of the at least one of the luminescent tags to a predetermined value (temporal signature, p. 2, para. 0038).

Re claim 5, McGrew teaches at least one of the tags is selected from the group consisting of dyes, inks and pigments (p. 2, para. 0035).

Re claim 9, McGrew teaches the tag has characteristics that can be detected as an image, a wavelength, a luminescence decay time or a combination thereof (p. 2, para. 0037-0038, 0040-0041, p. 3, para. 0042, p. 4, para. 0062).

Re claim 10, McGrew teaches the tag is compatible with deposition on a substrate selected from the group consisting of paper, cloth, plastic, metal, leather, thread, metal or plastic, foil, wrapping, coatings, films, holographic materials, label or card stock, printing inks, sprays, adhesives and glass (p. 2, para. 0035, p. 4, para. 0070).

Re claim 12, McGrew teaches one or more of the tags partially or completely overlaps another of the tags when applied to the product (p. 2, para. 009-0040, layers of quantum dots, p. 3, para. 0045).

Re claim 13, McGrew teaches the information technology component is capable of resolving the signal detected by the optical scanning system into components each of which can be further analyzed (p. 2, para. 0037-0040, p. 4, para. 0062).

Re claim 14, McGrew teaches analysis comprises identification of the spectral characteristics of the component as a function of time (p. 2, para. 0037-0038).

Re claim 15, McGrew teaches further analysis also includes the determination of whether the tag is authentic (p. 2, para. 0041-0042, p. 3, para. 0042-0043).

Re claim 16, McGrew teaches the optical scanning component comprises a light source, and a scanner (p. 2, para. 0035p. 2-3, para. 0042, p. 4, para. 0067).

Re claim 17, McGrew teaches the tags are applied at different times (tags are applied in batches and layers, p. 3, para. 0045).

Re claim 20, McGrew teaches two or more tags (there are many labels in the system, p. 2, para. 0041).

Re claim 23, McGrew teaches at least one of the dyes has an emitted signal of known wavelength band and known decay time (p. 2, para. 0037-0041).

Re claim 24, McGrew teaches the tag is applied to the substrate using a method of printing, including ink jet, continuous ink jet, thermal transfer, pad, offset, gravure, flexographic, or screen printing (p. 2, para. 0035, p. 3, para. 0056).

Re claim 47, McGrew teach the characteristics that can be modified in each of the tags is selected from the group consisting of (a) dye, pigment or ink, (change concentration/quantity in ink, p. 2, para. 0034), (b) size or shape (size, p. 2, para. 0033),

(c) position of one tag in relation to another (batches of dots formed on the surface, each surface has it's own distinct pattern, p. 3, para. 0045).

McGrew as modified by Ahlers, as applied to claim 1 above, fails to teach the ability to change with time or when exposed to conditions such as heat, light or contact with solvent.

However, Ahlers teaches the ability to change with time or when exposed to conditions such as heat, light or contact with a solvent (p. 2, para. 0025-0027).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify McGrew as modified by Ahlers with the additional teachings of Ahlers for the benefit of providing an additional security variable. Because the decay of the luminescence intensity is measured to authenticate the product, providing a variety of decay signatures would further make it more difficult for counterfeiters to counterfeit the proper expected decay signature.

Re claim 48, McGrew teaches the optical scanning component utilizes photoexcitation created by one or more pulsed light sources (p. 4, para. 0067).

5. Claim 31 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over McGrew (Publication No.: US 2002/0021003 A1), as applied to claim 30 above, and further in view of Berson (US Patent No.: 5,502,304). The teachings of McGrew are disclosed above.

Re claims 31 and 49, McGrew fails to disclose the luminescent compound is a lanthanide chelate.

Berson teaches at least one of the tags is a mixture of more than one compound (complex), the tags is a mixture of a luminescent compound and a luminescence lifetime modifier, the luminescent compound is a lanthanide chelate including europium, terbium, samarium, gadolinium, neodymium and ytterbium (col. 3, line 62- col. 4, line 16, col. 4, lines 44-47).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify McGrew with Berson because the composition provides narrow emission bands, therefore reducing interference (Berson, col. 4, lines 8-27).

6. Claims 7 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over McGrew (Publication No.: US 2002/0021003 A1) in view of Ahlers (Publication No.: US 2002/0131618 A1), as applied to claim 1 above, and further in view of Berson (US Patent No.: 5,502,304). The teachings of McGrew as modified by Ahlers are shown above.

Re claim 7, McGrew as modified by Ahlers fails to disclose the luminescent compound is a lanthanide chelate.

Berson teaches at least one of the tags is a mixture of more than one compound (complex), the tags is a mixture of a luminescent compound and a luminescence lifetime modifier, the luminescent compound is a lanthanide chelate (col. 3, line 62- col. 4, line 16, col. 4, lines 44-47).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify McGrew as modified by Ahlers with Berson because

the composition provides narrow emission bands, therefore reducing interference (Berson, col. 4, lines 8-27).

With respect to claim 19 McGrew disclose two or more luminescent fluorescent tags (p. 2, para. 0039-0041).

Ahlers disclose a luminescent lifetime modifier (p. 2, para. 0025).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify McGrew with Ahlers in order to provide a way of varying the security feature of the luminescence decay time. Thus specific temporal signatures can be designed for the authentication tags (Ahlers, p. 2, para. 0025).

McGrew as modified by Ahlers fails to disclose the luminescent compound is a lanthanide chelate.

Berson teaches at least one of the tags is a mixture of more than one compound (complex), the tags is a mixture of a luminescent compound and a luminescence lifetime modifier, the luminescent compound is a lanthanide chelate col. 3, line 62- col. 4, line 16, col. 4, lines 44-47).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify McGrew as modified by Ahlers with Berson because the composition provides narrow emission bands, therefore reducing interference (Berson, col. 4, lines 8-27).

7. Claims 28, 32, 34-35, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over McGrew (Publication No.: US 2002/0021003 A1) as applied to claims

25 and 30 above, and further in view of Reed (Publication No.: US 2002/0090112 A1). The teachings of McGrew as modified by Ahlers are disclosed above.

Re claim 28, McGrew fails to teach at least one of the tags is invisible to the human eye.

Reed teaches at least one of the tags is invisible to the human eye (p. 2, para. 0027).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify McGrew as modified by Ahlers with Reed for providing a security feature that is not normally detectable by the unaided human eye, and thus making it more difficult to counterfeit products because the security feature is hidden, and therefore counterfeiters may be aware of the security feature.

Re claim 32, McGrew fails to disclose at least one of the tags is near-infrared dye.

Reed teaches at least one of the tags is near-infrared dye (p. 2, para. 0027).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify McGrew with Reed for providing a security feature that is not normally detectable by the unaided human eye, and thus making it more difficult to counterfeit products because the security feature is hidden, and therefore counterfeiters may be aware of the security feature.

With respect to claims 34 and 35, McGrew fails to teach the decay time of luminescence or luminescence peak intensities for dye tags are used to establish a comparison of treated and untreated samples.

Reed teaches the decay time of luminescence and luminescence peak intensities for dye tags are used to establish a comparison of treated and untreated samples (one security feature of the tag is that it is invisible due to wave emission cancellation when untreated based on the peak intensities having opposite peak values at the same time Fig. 1, p. 3, para. 0031, decay times for the tags are set p. 2, para. 0029-0030, another feature is that detector readable emission occurs after the tag is treated with electromagnetic radiation, pulse, from the light source, p. 3, para. 0033-0034, based on the received emission from the tag during the time range, validity of the tag is determined, p. 4-5, para. 0054, therefore a comparison must be made of these two features in order to determine the authenticity of the product).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify McGrew with Reed for providing an additional security feature that provides a particular emission pattern after being treated, different from before being treated, and thus confirm that that the security feature is authentic.

Re claim 37, McGrew fails to disclose the dye tagged samples are irradiated before spectral analysis using lamps that include an element selected from the group consisting of xenon, halogen, and mercury, or laser sources selected from the group consisting of solid state, Nd/YAG, dye, and nitrogen lasers.

Reed teaches the dye tagged samples are irradiated before spectral analysis using lamps that include an element selected from the group consisting of xenon, halogen, and mercury, or laser sources selected from the group consisting of solid state, Nd/YAG, dye, and nitrogen lasers (solid state laser, p. 3, para. 0041).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify McGrew with Reed because solid state lasers provide a distinct wavelength to use as a light source, and thus a specific amount of energy can be chosen to cause the fluorescence of the exposed material.

8. Claims 8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over McGrew (Publication No.: US 2002/0021003 A1) in view of Ahlers (Publication No.: US 2002/0131618 A1) as applied to claim 2 above, and further in view of Reed (Publication No.: US 2002/0090112 A1). The teachings of McGrew as modified by Ahlers are disclosed above.

Re claim 8, McGrew teach the known time resolution corresponds to an exponential, or sum of exponential functions with decay constants (1/e) (Fig. 6).

McGrew fail to teach the time window of decay is of 1 microsecond to 1 second.

Reed teaches the known time resolution for decay fall in the time window of 1 microsecond to 1 second (p. 2, para. 0029-0030).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify McGrew as modified by Ahlers with Reed for providing a reasonable time frame that the reader would take a reading of the tag to determined authenticity.

Re claim 11, McGrew fails to teach at least one of the tags is invisible to the human eye.

Reed teaches at least one of the tags is invisible to the human eye (p. 2, para. 0027).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify McGrew as modified by Ahlers with Reed for providing a security feature that is not normally detectable by the unaided human eye, and thus making it more difficult to counterfeit products because the security feature is hidden, and therefore counterfeiters may be aware of the security feature.

9. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over McGrew (Publication No.: US 2002/0021003 A1) in view of Ahlers (Publication No.: US 2002/0131618 A1) as applied to claim 21 above, and further in view of Diamandis (US Patent No.: 5,854,008). The teachings of McGrew as modified by Ahlers are disclosed above.

Re claim 22, McGrew as modified by Ahlers fails to disclose an identity of a lifetime modifier of the tag.

Diamandis teach a marker consisting of lanthanide chelates and carboxylic acids.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify McGrew as modified by Ahlers with Diamandis because the lanthanide chelates are sensitive time-resolved fluorometric markers useful for commercial application (Diamandis, col. 1, line 64- col. 2, lines 25), and the carboxylic acid results in better detection because of amplified fluorescence (Diamandis, col. 4, line 55-col. 6, line 21).

1. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over McGrew (Publication No.: US 2002/0021003 A1) in view of Ahlers (Publication No.: US

2002/0131618 A1), as applied to claim 1 above, and further in view of West (US Patent No.: 5,005,873).

McGrew as modified by Ahlers fails to disclose that the tags can be applied at the same time.

West teaches applying two different tags at the same time by mixing the first and second tag materials in a homogeneous mixture for application (West, col. 5, lines 57-68).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify McGrew as modified by Ahlers such that tags be applied at the same time in order to reduce the number of steps and time of a manufacturing sequence that would eliminate producing multiple layers on top of each other.

Response to Arguments

Applicant's arguments with respect to claims including the limitation "decay time of luminescence intensity," have been considered but are moot in view of the new ground(s) of rejection. The examiner has introduced reference McGrew and Ahlers both of which address decay time of luminescence intensity.

Further with respect to claim 36 (see above), as further evidence, Chang (Patent No.: 5,427,415) teaches the uses of latent image ink that is visibly sensitive to temperature as used as a security feature for identifying the authenticity of sensitive documents such as checks.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Jones, II (Patent No.: US 6,402,986 B1)
- Muller (Publication No.: US 2004/0031931 A1) measures the intensity emission as a function of time of an authentication marking.
- Chang (Patent No.: 5,427,415) uses latent image ink sensitive to heat to become visible, applied to checks.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CAROL HESSE whose telephone number is (571)272-9788. The examiner can normally be reached on Monday-Thursday 7:30-5:00, e/o Friday 7:30-4:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lee can be reached on 571-272-2398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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